

## **Application of Management Information System in Road Construction**

### **Project Delivery: A Study of SETRACO Nigeria Limited<sup>1</sup>**

**Temitope Edward Akinwumi<sup>I</sup>, Ibeawuchi Ifeanyi Echeme<sup>II</sup>,  
And Emmanuel Chinenye Ubani<sup>II</sup>**

<sup>I</sup> Reset Oil & Gas Engineering Services Limited, Port Harcourt, Rivers State, Nigeria

<sup>II</sup> Department of Project Management Technology, Federal University of Technology, Owerri,  
Imo State, Nigeria

#### **Abstract**

This study is on the application of Management Information System in Road Construction Project Delivery: A Study of SETRACO Ltd. The objectives are: to determine the nature of relationship between organization experience on management information system and road construction project delivery by SETRACO; to determine the effect of funding on the application of management information system in road construction project delivery; to assess how the level of experience of personnel affect the application of management information system in road construction project delivery; to determine the effect of geographical location on the application of management information system in the delivery of road construction project, to determine the collective effect of the identified factors on the application of management information system (MIS) in road construction project delivery. Survey research design was adopted and questionnaire was designed to collect data. Data collected were analyzed using correlation analysis and multiple regression analytical model. The results indicate that adequate funding and level of personnel experience are critical in the application of MIS in road construction project delivery in Nigeria. The study, therefore, recommends adequate and prompt funding by adopting expenditure control structure and training and retraining of construction staff on the MIS packages and principles for application in road construction project delivery.

**Keywords:** Road Construction projects, Management Information System, Funding, Level of Experience, Geographical Location.

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## 1.0 Introduction

One of the most vital elements that can serve as the key to achieving competitiveness is the provision of infrastructure. In general, infrastructure serves as the backbone of a functioning society by providing a well-suited environment for upgrading the economic status of a country. Research conducted by Oladoja, (2025) claim that there is a positive correlation between public infrastructure and productivity aggregated to the national level. Infrastructure affects economic growth through its impact on profitability, levels of output, income and employment through lessening production costs (Oladoja, 2025; NEDA, 2000). However, this study focused on road infrastructure projects because, roads are catalysts in promoting economic activity. It helps an economy adapt to the rapid pace of globalization. Roads promote the mobility of goods and services. However, the costs of transportation are considered as a crucial determinant of the location, scale of economic activity, and the pattern of trade (Oladoja, 2025).

Project management is the discipline of organizing and managing resources in such a way that resources deliver all the work required to complete a project within defined scope, time and cost constraints. A project is a temporary and one-time endeavor undertaken to create a unique product or service (Chizea, 2012). This property of being a temporary and one-time undertaking contrasts with processes or operations, which are permanent or semi-permanent ongoing functional work to create the same product or service over-and-over again. The management of these two systems is often very different and requires varying technical skills and philosophy, hence requiring the development of project management (Akpan & Chizea, 2007).

However, the first challenge of project management is ensuring that a project is delivered within the defined constraints. The second, more ambitious, challenge is the optimized allocation and integration of the inputs needed to meet those pre-defined objectives. These challenges have resulted in the numerous project failures and subsequent abandonment (Tajudeen, 2021). As posited by Oladoja, (2025), there are so many construction firms that need a system for keeping information on the course of project development. For example, information on workers, resources, project sponsor, starting date, expected completion date, the project manager, etc. Hence, project management information system is a system that provides procedures to store and makes available information concerning part of project management, and to assist organization-related activities in project development, which makes most of the project management goals achievable (Rehnault, 2024). It is against this background that this study was set to analyze level of application of information management systems to enhanced delivery of road construction projects in Nigeria.

Management information system aid in managing and coordinating all the aspect of project

planning and implementation. Without proper management information system developed to manage project execution process, success may not be realized (Sandanth, 2021). Casual observation indicates that a lot of construction projects especially, road projects have failed in many locations and Tajudeen, (2021), has pointed among other factors, poor management of information as the most critical variable in the delivery of road construction projects. Unfortunately, not much attention is giving to the application of management information system to the planning and execution of construction projects.

However, one of the most critical component of determining resource requirements and for a construction project to be successful is to be realistic in the application of management information system (Tajudeen, 2021). Similarly, one of the most common mistakes project managers make is to underestimate the amount and type of resources required in construction project management (Rehnault, 2024). As a result, construction projects have experienced fatigue with respect to cost and time overrun. It is likely that surprises and conflicts may occur during the implementation stage of the project, but with the help of project management information system, project goal will be accomplish as required, especially, road construction projects.

Several researchers like Sandanth, (2021); Tajudeen, (2021) have made suggestions on the means of overcoming this prevailing challenge, unfortunately it still persist. Since it is necessary to keep track or monitor project development process and resources, this study is mounted to provide a lasting solution by identifying and analyzing the major variables that impede the application of management information system. Hence, there is a need for a project management information system which provides effective ways of handling record keeping of all project resources and ensure that supporting information is available whenever it is needed.

The specific objectives are:

- a) To determine the nature of relationship between organization experience on management information system and road construction project delivery in SETRACO;
- b) To determine the effect of funding on the application of management information system in road construction project delivery in the Company;
- c) To assess how the level of experience of personnel affect the application of management information system in road construction project delivery;
- d) To determine the effect of geographical location on the application of management information system in the delivery of road construction project;
- e) To determine the collective effect of the identified factors on the application of Management Information System (MIS) in road construction project delivery.

The following hypotheses were formulated to aid the achievement of the research objectives;

**H<sub>01</sub>:** The nature of relationship between organization experience on management information system and road construction project delivery in SETRACO is not significant.

**H<sub>02</sub>:** The effect of funding on the application of management information system in road construction project delivery in the Company is not significant.

**H<sub>03</sub>:** The level of experience of personnel cannot significantly affect the application of management information system in road construction project delivery.

**H<sub>04</sub>:** Geographical location have no significant effect on the application of management information system in road construction project delivery.

**H<sub>05</sub>:** The collective effect of the identified factors on the application of Management Information System (MIS) in road construction project delivery is not significant.

## 2. Literature Review

The industrial revolution has changed the man's way of life remarkably. However, the advantages derived from the revolution have not been without a price. Man's improved technology and the way of living is vastly increasing the development of road network (Ashwart, 2020). As man uses the resources of the earth, particularly from the industries, he brings about changes in his environment. The emergence of road network development in Nigeria over a decade ago has brought tremendous financial benefits to the country (Oladoja, 2025). A lot of construction firms have played key roles in the development of Nigerian roads. However, SETRACO Construction Limited is one of the major firms that have contributed immensely in this direction (Akinwumi, 2026).

As claimed by Akinwumi (2026), SETRACO is the Building and Civil Engineering division of the Zard Group of companies, which has over sixty years working experience in Nigeria. Their spheres of operation include roads, bridges, railways, industrial complexes, housing estates and water schemes including dams and sewage works. In 1987, they acquired substantial assets from Taylor Woodrow (Nigeria) Limited to which they have been adding continually so that they now have over Twenty Million U.S. Dollars' worth of Plant and equipment.

SETRACO was established in 1977 and started by constructing township and district roads in what was then Bendel State. Over the last thirty years the Company has rapidly grown to become one of the largest construction companies in Nigeria specialized in roads and bridges. With a presence today in around 20 states; SETRACO has played a key role in developing Nigeria's infrastructure as the Country strives towards becoming a developed nation.

## 2.1 Determinants of Road Construction

An efficient land transport infrastructure through an extensive road network has enormous multiplier effects on the economy. The increase in population coupled with the consecutive governments' drives to link the remote villages in Nigeria has led to an increased need for roads and highways, as part of the Federal and State Governments' plans for increase road infrastructure.

**Economic variables:** A major determinant of road infrastructure allocated is the number of private establishments in the area. An observed clustering of services or industry in relation to population is a key criterion (Wanmali & Islam, 2019). Rural areas where there is lesser clustering are provided with basic infrastructure that are complemented by more complex service provision in the centers because this can initiate the strengthening of the peripheral system. Major district roads are used to connect urban centers and others with equal and higher importance while village roads are used to connect the rural areas in order to attract more business in the urban center, therefore strengthening it more including the peripheral areas surrounding it.

Another factor that is used in the estimating the determinants of road infrastructure is funds allocated per region. However, it is deemed that the greater the funds allocated in a region the more the capacity it has in providing region's funding allocation to construct roads.

**Geographic Variables:** The number of vehicles is one of the geographic variables that affects road construction. Based on an article of Kajita et al. (2021), one decision to improve roads in terms of quality and quantity includes traffic congestion in the area which is represented by the number of vehicles. Another geographic variable that is associated with the provision of roads in a region is its population density. There is a negative relationship between the population density and the provision of roads. According to Randolph et al. (2019), low population density requires higher expenditure for a given level of infrastructure specifically for telecommunications and roads.

**Political Variables:** To support the importance of the political variable and actual expenditure on road construction, Friedmann's center-periphery model as mentioned by Bakaric et al. (2015) was used. Referring to the traditional export base theory, Friedmann (2017) stressed out the importance of local politics, economy, and leadership roles; even the impact of the development history of a region. Big urban areas have initial competitive advantage for new growth because these will incur lower urbanization costs. Based on this theory, all factors favor the central regions while peripheral regions differ according to the relative autonomy of their economy. This theory implies that the leadership style of a certain region will indirectly affect the performance of that area. It is essential to note that all variables have important roles in explaining and determining the factors that establish road provision among regions (Sandanth, 2021).

Having discussed the various determinants of road construction, it is deemed that provision of roads vary across regions depending on its current economic, political and geographical status. However, one factor that could be attributed to these variations is the classification of a certain region, whether it is the center or the periphery (Akinwumi, 2026).

## **2.2 Highway Construction**

Highway construction is the process of adding infrastructure to our built environment. Owners of these projects are usually government agencies, either at the national or local level. As in building construction, highway construction has design, financial, and legal considerations, however these projects are usually undertaken for profit, and to service the public interest (Uchendu & Echeme, 2026). They undertake the construction of access roads, railroads, general site grading, and massive earthwork projects, as in building construction.

During the planning of a building, the zoning and planning boards they will review the overall compliance of the proposed Highway Road project with the municipal General Plan and zoning regulations. Once the proposed Road project has been approved, detailed civil, architectural and structural plans must be submitted to the municipal Civil department and sometimes the public works department to determine compliance with the project code and sometimes for fit with existing infrastructure (Oladoja, 2025). Often, the Federal Ministry of Works will review the plans for compliance with adequate safety ordinances and regulations.

During the construction of a Road, the Government inspector inspects the project periodically to ensure that the construction adheres to the approved plans and the local code. Once construction is complete and a final inspection has been passed, an occupancy permit may be issued.

## **2.3 Factors Influencing Road Project Execution**

The most important aspect of project execution is the determination of human resources which their activities are unquantifiable and form greater factor that influence the execution of any project. According to Chizea (2012) a project manager is often a client representative and has to determine and implement the exact needs of the client based on knowledge of the firm he/she is representing. The ability to adapt to the various internal procedures of the contracting party, and to form close links with the nominated representatives, is essential in ensuring that the key issues of cost, time, quality and above all client satisfaction can be realized.

In whatever field, a successful project manager must be able to envisage the entire project from start to finish and to have the ability to ensure that this vision is realized. Any type of product or

service like, road construction, buildings, vehicles, electronics, computer software, financial services, etc., may have its implementation overseen by a project manager and its operations by a product manager (Oladoja, 2025).

Project managers can be found in all industries. Their numbers have grown rapidly as industry and commerce has realized that much of what it does is project work. And as project based organizations have started to emerge, project management is becoming established as both a professional career path and a way of controlling business. So opportunities in project management now exist not only in being a project manager, but also as part of the support team in a project or program office or as a team leader for part of a project (Uchendu & Echeme, 2026). There are also qualifications that can be attained through the professional associations.

One reason for the rapid growth is the need to understand how to look after complex projects, often in high tech areas, which are critical to a business success but also have to use scarce resources efficiently. Most people still want their projects to be on time, meet quality objectives, and not cost more than the budget. These form the classic time, quality, cost triangle (Anyanwu, 2024). In fact, if you have an unlimited budget and unlimited time, project management becomes rather easy. For most people, however, time and money are critical and that is what makes project management so important today.

## 2.4 Empirical Review

A lot of studies have been made in the area of MIS in relation to successful project delivery. Accordingly, Veron (2019) did a study on Management information system and it application in delivering Mega projects in Bangladesh: the policy perspective. Veron (2019) claim that any mega project that is not capable of assisting citizens access to affordable livelihood is anti-developmental. However, critical review of her study show that poverty and poor funding of MIS in projects delivery. Her study also revealed that poor implementation of information technology policy, and literacy level has been negatively affecting the effort of the contractors to apply MIS in mega projects delivery. Questionnaire was adopted in collecting data and t-test was adopted data analysis. The t-test analysis of the data show that funding and literacy level of personnel are critical to the application of MIS and delivery of projects. Unfortunately, Veron (2019) did not also determine whether these factors have collective effect on the successful delivery of mega projects in Bangladesh.

Sandanth, (2021) did a related study on the factors associated with information technology (IT) in the delivery of construction projects in India. The study identified poverty, high exchange rate, low skill of personnel and project location as the major factors. Questionnaire was adopted in data collection procedure and the Chi-Square analytical technique was used in the analysis of the

collected data. The result show that poverty level is responsible for poor adoption of IT in construction project delivery in India. The study recommended a policy that will encourage the application of IT in the planning and implementation of construction projects. Unfortunately, the study failed to ascertain the collective effects of these factors on the application of information technology in construction project delivery.

Also, Ashwart, (2020) did a research on the Critical Factors that inhibits adoption of information technology for the delivery of housing projects in Nepal. His study identified poverty, corruption, literacy level of operatives, lack of funds, and poor commitment as the critical factors that influence adoption of IT for the delivery of housing projects. The study therefore developed a framework, using these critical factors, that will assist in creating awareness and adopting of IT methodology in the delivery of housing projects in Nepal and other developing countries. Descriptive statistics was adopted in analyzing the data collected through questionnaire. The study concludes by advocating for a policy that will encourage both government and contractors to adopt IT in housing projects delivery that will make housing affordable to all and enhance economic activities. But the study did not determine the effect of the critical factors of MIS in housing projects.

Santos (2016) did a research on the issues surrounding MIS and its adoption in project planning and implementation in Philippine. In the course of his study, he identified poverty, project location, level of project personnel, and lack of willingness to invest in MIS and its methodologies. Data were collected using structured questionnaire and t-test analytical technique was adopted for analysis which reveal that all the factors are significant to the adoption of MIS in planning and implementation of projects. The study, therefore recommended appropriate and prompt funding, training and retraining project personnel in the planning and implementation of projects. However, the study could not ascertain the collective effects of the factors in the planning and implementation of projects in Philippines.

Lastly, Tajudeen (2021) undertook a study on an analysis of the factors affecting the application of Information Technology (IT) in the delivery of High rise construction projects in Nigeria. The study identified poverty, unwillingness to embrace technology, geographical location of projects, literacy level of staff, and lack of funding are associated with the application of IT for successful delivery of high rise construction projects in Nigeria. Data were collected through administration of questionnaire and the data collected was analyzed qualitatively. The qualitative analysis show that more efforts should be made by the various stakeholders in the construction projects to provide adequate funding for the application of IT in the delivery of high rise construction projects in Nigeria. However, the study lacks quantitative analysis.

Base on content analysis of the literature, the study identified funding, level of experience of

personnel, and geographical location as the factors affecting the application of MIS in the delivery of construction projects.

## 2.5 Research Gap

None of the relevant reviewed studies was able to investigate into management information systems and its application the delivery of construction projects in Nigeria, as a result, none of them was able to empirically assess the collective effect of MIS related factors in the delivery of construction projects in Nigeria.

Therefore, this study intends to fill the identified literature gaps for enhanced delivery of construction projects through the application of MIS methodology for enhance economic development.

## 3.0 Research Methodology

This study adopted descriptive survey design. This was done because a study like this require to be observational as well as inferential. Hence, the researcher observed the actual events in the field and based on that, questionnaire was designed to collect primary data from participants. However, Nworuh, (2017) asserts that a comprehensive study should include both observational and inferential. Being a descriptive study, it is aimed at generating new facts through the cross-sectional survey method. According to Kothari, and Gaurav, (2014) and Sekaran (2013), cross-sectioned survey relies on a sample of elements from the production of interest which are measured at a single point in time.

### 3.1 Population of the Study

The population of this study include a cross section of the workers of SETRACO Nigeria Limited, who are working in the departments that handle construction projects and some selected sub-contractors that work with SETRACO. Based on the personnel records of the construction firms, the population is one hundred and thirty-one (131) participants. This population comprise of the Architects, Engineers, Site Workers, Site Foreman, Sub-contractors. The population of study is categorized as sown in Table 1.

**Table 1 Determination of the Population Size**

| S/No. | Respondent Category | Population Size |
|-------|---------------------|-----------------|
| 1     | Architects          | 14              |
| 2     | Engineers           | 35              |
| 3     | Site Workers        | 60              |

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|   |                 |            |
|---|-----------------|------------|
| 4 | Site Foreman    | 11         |
| 5 | Sub-contractors | 11         |
|   | <b>Total</b>    | <b>131</b> |

Due to the cumbersome nature and the complex burden of reaching out to all the staff, a considerable number were used, and which serve as the sample size.

However, the sample size is obtained using Taro Yamane's sample size statistical formula, which is obtained from the population size:

$$\text{Hence, } n = \frac{N}{(1 + N(e^2))}$$

Where,

- n = Sample size to be determined
- N = Population size = 131
- e = Allowable Sampling error taken at 5%
- 1 = Statistical constant

Substituted as:

$$n = 131 / \{1 + 131(0.05)^2\} = 98$$

In this study, the sample size is ninety-eight (98) respondents.

The stratified sampling technique was used to guarantee that the sample is a true representation of the needed population, free of error and systematic variation, as well as the inclusion of elements or respondents that do not truly belong to the population of interest. This was accomplished by randomly sampling of each stratum (Architects, Engineers, Site Workers, Site Foremen, and sub-contractors).

### 3.2 Method of Data Collection.

The study adopted the primary and secondary sources of data collection. The primary data were sourced through the questionnaire distributed and collected. Secondary data were collected from the company's project data, journals, periodicals, internet search, project planning and implementation manuals and text books. The data gathered from these sources were utilized to develop the study hypothesis and create the questionnaire using Likert's five-point scale.

#### a.) Validity Test of Instrument

In establishing the validity of the instruments, a face and content validity approach was employed where a pilot study for the text of validity was conducted. Fifteen (15) copies of the sample

questionnaire were given out for completion. Questions that were not understood were clarified and rephrased before the test was conducted. The drafted questionnaire was given to the academic professionals who validated the structure, content and relevance of question to the study through necessary corrections and changes.

### **b.) Reliability Test**

A test re-test method was used to test the reliability of the instruments. The questionnaire was administered in a smaller study population and the process repeated one week later. The results were compared for consistency using the Cronbach's Alpha test under a Reliability coefficient of 0.7 for acceptance. A Cronbach's Alpha value of 0.84 confirm the reliability of the instrument.

Several measures were taken to ensure the reliability of the instrument that was used for the study. Efforts were made to verify the questions asked are relevant to the objectives of the research and that the wordings of the questions carried the exact meaning and purpose of the research. While the comments, suggestion and corrections were made, the responses were effectively translated to avoid error of omission or commission. However, for ethical concerns, the confidentiality of the information supplied by the respondents was kept secret and only presented for analytical purposes.

## **3.3 Method of Data Analysis**

The statistical tools adopted for analysis include Descriptive Statistics involving Mean, Charts, Correlation analysis and Multiple Regression analytical model.

The descriptive statistics method helped in analyzing the demographics of respondents and other relevant questions answering research objectives. The data analysis techniques used for the test of hypothesis are multiple regression and correlation method. The correlation analysis was adopted in testing hypothesis one ( $H_{01}$ ) while the t-test scores generated from multiple regression result was used to test hypotheses two ( $H_{02}$ ), three ( $H_{03}$ ) and four ( $H_{04}$ ). Also, Analysis of Variance (ANOVA) score generated from the multiple regression result was used to test hypothesis five ( $H_{05}$ ). Multiple regressions approximate these real-life problems, where it measures the relationship existing between three or two variables. The multiple regressions help to understand the complexity of the interaction in business world. Again, the aim of multiple regressions, according to Sekaran, (2013), is to examine the nature of the relationship between a given dependent variable and two or more independent variables in a regression function. The concepts and techniques for analyzing the relationships between a dependent variable and several independent variables, are a straightforward extension of those involved in simple regression, the computations are however more complex and tedious as claimed by Kothari and Gaurav (2014).

However, with the help of electronic computer aided SPSS, it was done easily.

In multiple regression, the model describing the relationship between dependent variables Y and a set K independent variable  $X_1, X_2, \dots, X_K$  can be expressed as:

$$Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + \dots + e$$

### 3.4 Decision Rule

The test was conducted at 5% level of significance. A computer software based multiple regression analysis called statistical program for social science (SPSS) version 21 was used in the data analysis. The decision rule is thus if power of test (p - value) or significance is less than  $\alpha$ , the null hypothesis is rejected, and the alternative hypothesis accepted, but if the other way round, the test is therefore said not to be significant.

### 3.5 Model Specification using Multiple Regression Analysis

In estimating the predictive regression model, the study established dependent and independent variables.

**Dependent Variable:** Y = Road construction project delivery.

**Independent Variables:**  $X_1$ (funding);  $X_2$  (level of experience of the personnel);  $X_3$ (geographical location).

## 4. Results and Discussions

A total of ninety-eight (98) copies of the questionnaire were distributed to the selected respondents and due to the nature of questionnaire administration, the study recorded a 100% response rate. This is because 98 copies of well completed questionnaire were returned and this forms the basis for analyses made in this study.

### 4.1 Educational and Work Experience of the Respondents

The educational and years of experience of the selected respondents were illustrated in Tables 2 and 3.

**Table 2 Educational Level of Respondents**

| <b>Educational Level</b> | <b>Frequency</b> | <b>Percentage (%)</b> |
|--------------------------|------------------|-----------------------|
| Higher degree            | 32               | 32.65                 |
| Degree                   | 46               | 46.94                 |
| Diploma                  | 20               | 20.41                 |
| <b>TOTAL</b>             | <b>98</b>        | <b>100</b>            |

From Table 2, majority of the respondents (about 79.59%) are well educated and can understand the questions in the questionnaire for good assessment.

**Table 3 General Work Experience**

| <b>WORK EXPERIENCE</b> | <b>FREQUENCY</b> | <b>PERCENTAGE (%)</b> |
|------------------------|------------------|-----------------------|
| 1-5 years              | 5                | 5.1                   |
| 6-10 years             | 10               | 10.20                 |
| 11-15 years            | 23               | 23.47                 |
| 16-20 years            | 34               | 34.69                 |
| Above 20               | 26               | 26.53                 |
| <b>TOTAL</b>           | <b>98</b>        | <b>100</b>            |

From the table 3, 85% of the respondents have worked for more than ten (10) years and as such are experienced in the field to provide reliably information out of many of work exposure.

## 4.2 Correlation Analysis

Hypothesis one was analyzed in Table 4 in order to establish the level of relationship existing between organization experience on management information system and road construction project delivery.

**H<sub>01</sub>:** The nature of relationship between organization experience on management information system and road construction project delivery in SETRACO is not significant.

The correlation analysis was adopted in testing hypothesis one (H<sub>01</sub>) as follows:

**Table 4 Correlation Result for Testing H<sub>01</sub>**

|          |                     | EXPONMIS | Y      |
|----------|---------------------|----------|--------|
| EXPONMIS | Pearson Correlation | 1        | .880** |
|          | Sig. (2-tailed)     |          | .002   |
|          | N                   | 98       | 98     |
| Y        | Pearson Correlation | .880**   | 1      |
|          | Sig. (2-tailed)     | .002     |        |
|          | N                   | 98       | 98     |

From Table 4, the correlation (r) result indicates that there is a significant correlation between organizational experience on MIS and successful delivery of road construction projects. This is based on an r-score of 0.880 which is significant at a significance level of 0.002, implying that at 0.05 level of significance, the hypothesis is false. The study rejects the null hypothesis (H<sub>01</sub>) and concludes that the level of relationship between organization experience on management information system and road construction project delivery in SETRACO is significant.

### 4.3 Analysis of Multiple Regression Result

The result of multiple regression analysis generated by the SPSS were analyzed as follows;

**Table 5 Descriptive Statistics from Multiple Regression Result**

|                | Mean    | Std. Deviation | N  |
|----------------|---------|----------------|----|
| Y              | 37.1327 | 4.01194        | 98 |
| X <sub>1</sub> | 19.2551 | 4.10509        | 98 |
| X <sub>2</sub> | 17.0918 | 4.82495        | 98 |
| X <sub>3</sub> | 18.9796 | 3.97150        | 98 |

Based on Table 5, the mean score of road construction project delivery (Y) is 37.1327. The indication is that the average level of performance achieved in road construction projects as a result of the three identified variables (funding, organization's experience and geographical location) is 37.13, which is very abysmal and necessitated this study.

However, the multiple regression coefficients generated through the aid of statistical package for social sciences (SPSS) were used to analyze the level of influences posed by the identified in the study via literature.

**Table 6 Coefficients of Multiple Regression**

| Model |                | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|-------|----------------|-----------------------------|------------|---------------------------|--------|------|
|       |                | B                           | Std. Error | Beta                      |        |      |
| 1     | (Constant)     | 34.537                      | 3.319      |                           | 10.406 | .000 |
|       | X <sub>1</sub> | .704                        | .101       | .504                      | 9.043  | .001 |
|       | X <sub>2</sub> | .678                        | .126       | .394                      | 5.912  | .006 |
|       | X <sub>3</sub> | .062                        | .184       | .061                      | 0.594  | .554 |

a. Dependent Variable: Y

From Table 6, the following model can be generated:

$$Y = 34.537 + 0.704X_1 + 0.678X_2 + 0.062X_3 \dots\dots\dots \text{(Equation. 1)}$$

The model generated show that all the identified factors exhibit positive influence on road construction project delivery. The implication is that both the MIS application factors and road construction delivery move in the same direction. The model also shows that funding (X<sub>1</sub>) has the highest effect on MIS application with a coefficient of 0.704. this is followed by level of organization's experience and geographical location.

The correlation coefficient of multiple regression (r) and coefficient of determination (r<sup>2</sup>) as a result of the model were analyzed using the scores generated from model summary.

**Table 7 Model Summary of Multiple Regression**

| Model | R                 | R Square | Adjusted Square | Std. Error of the Estimate |
|-------|-------------------|----------|-----------------|----------------------------|
| 1     | .815 <sup>a</sup> | .713     | .683            | .48477                     |

a. Predictors: (Constant), X<sub>3</sub>, X<sub>2</sub>, X<sub>1</sub>

From Table 7, an r-score of 0.815 indicates that the level of correlation between funding (X<sub>1</sub>), level of organization's experience on MIS (X<sub>2</sub>), geographical location (X<sub>3</sub>) and road construction project delivery is 81.5%. This is a high level of correlation between the dependent and independent variables. On the other hand, an r<sup>2</sup>-score of 0.713 implies that the model explained 71.3% of the total variations that exist between the dependent and independent variables. Only

28.7% of the variations were not explained and is believed to be caused by the unidentified variables. With an r-square score of 0.683, it implies that about 68.3% of the variations were explained and this is ideal.

To test the hypotheses two, three and four, the t-values in Table 6 becomes relevant.

**H<sub>02</sub>:** The effect of funding on the application of management information system in road construction project delivery in the Company is not significant.

From Table 6, a t-value of 9.043 indicates that adequate funding is significant for the application of MIS on road construction project delivery by SETRACO Nig. Ltd. at 0.001 asymptotic level. The implication is that at 0.05 level of significance, funding is significant. The study therefore, reject the null hypothesis (H<sub>02</sub>) with a conclusion that the level of effect that funding has on the application of management information system for road construction project delivery is significant.

**H<sub>03</sub>:** The level of experience of personnel cannot significantly affect the application of management information system in road construction project delivery.

From Table 6, a t-value of 5.912 indicates that level of experience of personnel is significant for the application of MIS on road construction project delivery by SETRACO Nig. Ltd. at 0.006 significance level. The implication is that at 0.05 level of significance, level of experience of personnel is significant. The study therefore, reject the null hypothesis (H<sub>03</sub>) and conclude that the level of experience of personnel affect the application of management information system for road construction project delivery.

**H<sub>04</sub>:** Geographical location have no significant effect on the application of management information system in road construction project delivery.

From Table 6, a t-value of 0.594 indicates that geographical location is not significant for the application of MIS on road construction project delivery by SETRACO Nig. Ltd. at 0.554 significance level. This implies that at 0.05 level of significance, geographical location is not significant. The study therefore, accept the null hypothesis (H<sub>04</sub>) and conclude that geographical location have no significant effect on the application of management information system for road construction project delivery.

Nevertheless, to ascertain whether the collective effect of the identified variables is significant or not on application of MIS for road construction projects, the study adopted the principle of the analysis of variance (ANOVA). It measures the level of effect among multiple variables in a

system.

**H<sub>05</sub>:** The collective effect of the identified factors on the application of MIS for road construction project delivery is not significant.

**Table 8 Analysis of Variance (ANOVA)**

| Model |            | Sum of Squares | df | Mean Square | F      | Sig.              |
|-------|------------|----------------|----|-------------|--------|-------------------|
| 1     | Regression | 820.600        | 3  | 273.333     | 24.689 | .000 <sup>b</sup> |
|       | Residual   | 1040.675       | 94 | 11.071      |        |                   |
|       | Total      | 1861.275       | 97 |             |        |                   |

a. Dependent Variable: Y

b. Predictors: (Constant), X3, X2, X1

From Table 8, an F-value of 24.689 indicates that adequate funding, level of experience of personnel and geographical location of road construction projects are collectively significant for the application of MIS on road construction project delivery at 0.000 level of significance. The implication is that at 0.05 level of significance, there is a significant collective effect of the three identified factors on the application of MIS for effective delivery of road construction project. The study therefore, reject the null hypothesis (H<sub>05</sub>) and conclude that the collective effect of the identified factors on the application of MIS for road construction project delivery is significant.

#### 4.4 Discussion of the Findings

Based on the analysis of the results and findings made, the following can be deduced by the study;

a.) From Table 4, there is a significant correlation between organizational experience on MIS and successful delivery of road construction projects. This result depicts reality because the level of experience and awareness of an organization towards MIS determines the level of skills possessed by that organization. This is in line with the findings made by Oladoja, (2025). Unfortunately, most construction firms in Nigeria still operates on traditional methodologies which affect the level of delivery of construction projects. The effect of this on the socioeconomic growth of the country can only be imagined.

b.) From Table 6, adequate funding is significant for the application of MIS on road construction project delivery. This finding also represent truism and corroborates with Uya (2021). This is because without proper and timely funding, it becomes difficult to achieve any set goal. So adequate and prompt funding is critical to the application of MIS in ensuring the delivery of road

construction projects in Nigeria.

c.) The level of experience of personnel is critical for the application of MIS on road construction project delivery by SETRACO Nig. Ltd and other construction firms in Nigeria. (see Table 6). There is no doubt that experience staff is an asset in an effort to apply MIS for the successful delivery of road construction projects. Nevertheless, most of the construction firms are transforming their mode of operation to meet up with the demands of modern construction projects of which Management Information System is one of such. However, this finding corroborates with the work of Ashwart, (2020) and Tajudeen (2021). Personnel training and retraining on MIS packages and application is necessary for a better understanding and application in the planning and implementation of road construction projects.

d.) From Table 6, a t-value of 0.594 indicates that geographical location is not critical for the application of MIS on road construction project delivery by SETRACO Nig. Ltd. and other related firms in the Nigeria construction industry. Nowadays, there is hardly any location in Nigeria where there is no signal to operate and apply the principle MIS to aid successful delivery of rod constriction projects as claimed by Oladoja, (2025). Hence, this finding is not a surprise.

e.) Adequate funding, level of experience of personnel and geographical location of road construction projects are collectively significant for the application of MIS on road construction project delivery (see Table 8). This finding contradict the result of hypothesis four ( $H_{04}$ ) which concludes that geographical location is not critical for the application of MIS in the delivery process of road construction projects. But, when viewed from another side, it is a reality that with adequate and prompt funding and experienced personnel, geographical location may not have significant effect on the application of effective MIS strategy for the delivery of road construction projects in Nigeria. However, Oladoja, (2025); Tajudeen (2021); and Ashwart, (2020) agree with findings made in this analysis.

This study has empirically justified the urgent need for the training and application of effective management information system (MIS) in the management of construction projects for successful delivery and improved socioeconomic development of Nigeria.

## 5. Conclusion

MIS and its application in road construction projects delivery is a modest study to awaken the need for improved delivery of road construction projects for growth and development in the economy of Nigeria. Based on the findings and discussions made, the study conclude with the following recommendations;

- a) The level of experience and awareness of SETRACO and other construction firms on MIS should be strengthened to improve the level of skills needed for road construction project delivery and other related construction projects.
- b) Adequate funding is the foundation of good management and performance. SETRACO and other Contractors, especially in road construction projects, must design a framework, for example the Expenditure Control Structure, to guaranty adequate and prompt release of funds for road construction project delivery.
- c) Personnel training and retraining on MIS packages and application is necessary for the smooth application in road construction project delivery in Nigeria is been advocated by this study. SETRACO and other construction firms should pay more attention to staff training to enhance their skills to deliver tasks in modern construction environment.
- d) Contingency plan should be made putting geographical location into consideration for road projects in remote areas of the country where network/ signal poses to allow the deployment of MIS in planning and implementing road construction projects.
- e) Since, there is a collective effect of the funding, level of experience and geographical location on the application of MIS in the delivery of road construction projects, contingency plan is critical. In a situation where other plans fail, this contingency plan can be adopted to overcomes local challenges and deliver road construction projects successfully using MIS packages and principles.

## **5.1 Contributions to Knowledge**

This study has been able to identify that funding and experience level are needed for the application of MIS in road construction project delivery in Nigeria.

Also the study discovered that geographical location is not needed for the application of MIS in the delivery of road construction projects.

## REFERENCES

- Akinwumi, T.E. (2026). *Application of Management Information System in Road Construction Project Delivery: A Study of SETRACO Nigeria Limited*, a thesis submitted to the Department of Project Management Technology, Federal University of Technology, Owerri, Imo State, Nigeria, pp. 54.
- Akpan, E.O.P. & Chizea, E.F. (2007). *Project Management: Theory and Practice*. FUTU Press Ltd, Owerri (4<sup>th</sup> edition).
- Anyanwu, I.J. (2024). The Theory of Project Management Triangle, *Journal of Construction and Development*, 3(1), pp. 45-56.
- Ashwart, S.T. (2020). Critical Factors that Inhibits Adoption of Information Technology for the Delivery of Housing Projects in Nepal, *Journal of Applied Scientific Research*, 2(4), pp.90.
- Bakaric, R, Stark, T., Deveon, Y. & So, T. (2015). Development through Effective Delivery of Construction Projects, *International Journal of Economic Reviews*, 2(3), pp. 56.
- Chizea, E.F. (2012). *Project Management: Construction Contracting & Management*, Nelix Resources, Ikeja Lagos, Nigeria, pp. 150-156.
- Friedmann, G. (2017) *Friedmann's Report, 2015*, Friedemanns Publishing House, New York, USA, pp.12
- Kajita, F., Wendy, R., & Hart, R. (2021) Project Management in the Contemporary Situation, *PM World Journal*, X(III), PP. 32-46.
- Kothari, C. R, & Gaurav, G. (2014). *Research Methodology (3rd ed.)*. New Delhi: New Age International Publishers.
- NEDA, (2000) *Employment and State of Livelihood of the rural dwellers in Nigeria*, A Quarterly Account of the National Employment and Development Agency, pp.37.
- Nworuh, G.E (2017). *Basic Research Methodology for Researchers Trainees and Trainers in Management Sciences*, (5<sup>th</sup> Edition), Ambix Printers Nigeria, Owerri.
- Oladoja, O.A. (2025) Road transportation and associated costs in the development of Rural areas in Southern region of Nigeria, *Journal of Transportation and Economic Development*, 4(1), pp. 45-57.

- Randolph, D., Tamri, R., & Ader, F. (2021). Road Construction projects and the associated costs of development, *International Journal of Construction Management*, 3(1), pp.49-61.
- Rehnault, S.J. (2024). A Review of the contributions of road projects on the Economic Development of Developing Economies, *Journal of Development and Transport*, 5(7), pp. 88-101.
- Sandanth, D. (2021) Factors associated with information technology (IT) in the delivery of construction projects in India, *International Journal of Development and Social Studies*, 3(5), pp. 54.
- Santos, D.F. (2016) Issues surrounding MIS and its adoption in project planning and implementation in Philippine, *Project Management Journal*, 2(1), January Edition, pp. 71.
- Sekaran, U. (2013). *Research Methods for Business – A skill Building Approach* (6th ed.). U.S: John Wiley & Sons.
- Tajudeen, Y.H. (2021) Analysis of the factors affecting the application of Information Technology (IT) in the delivery of High rise construction projects in Nigeria, <https://www.nigerianstat.gov.ng>, December, 17.
- Uchendu, G. & Echeme, I.I. (2026) Challenges that Influence Construction Project Designs in Rivers State, Nigeria, *PM World Journal*, XV(V), May, pp. 20-32.  
<https://pmworldlibrary.net/wp-content/uploads/2026/05/pmwj164-May2026-Uchenda-Echeme-construction-project-design-challenges.pdf>
- Uya F. (2021) *Funding and Sustainability of Road Construction Projects*, A thesis presented to the Postgraduate School, University of Ibadan, pp. 76.
- Veron, D.R. (2019) Management information system and it application in delivering Mega projects in Bangladesh: the policy perspective, *International Journal of Management and Development*, 3(1), pp. 94.
- Wanmali, K. & Islam, M. (2019) *Project Success through Expert Project Resource Allocation*, Singh Publication Ltd., Dubai, pp. 56.

## About the Authors



**Temitope Edward Akinwumi**

Imo State, Nigeria



**Temitope Edward Akinwumi** is the Executive Director, Reset Engineering Services Ltd, Port Harcourt, Rivers State, Nigeria. He is a seasoned Electrical/Electronics Engineer and a professional in providing expert services to Oil and Gas firms especially, in foreign procurement and engineering services. Hence, he has successfully secured executed numerous contracts in Government ministries and parastatals and Oil & Gas firms in Nigeria. Akinwumi obtained a postgraduate diploma in Management and an MBA in Project Management Technology from the Federal University of Technology, Owerri (FUTO), Imo State Nigeria. He is married with children.



**Ibeawuchi Ifeanyi Echeme, PhD**

Owerri, Nigeria



**Associate Professor, Ibeawuchi Ifeanyi Echeme** is a lecturer in the department of Project Management Technology, Federal University of Technology, Owerri. Echeme has a B.Tech, MSc, and PhD in Project Management Technology and has published more than Sixty (60) articles in both international and national reputable journals. Dr. Echeme has published a textbook on Project Time, Cost and Quality Management. He is a Chartered member of Chartered Institute of Project Managers Nigeria (CIPMN), Chartered member, Association of Practicing Project Managers of Nigeria (APPMON), Certified Project Director (CPD) and a member of International Project Management Professionals (IPMP). Dr. Echeme has presented papers in conferences and workshops within and outside Nigeria. He can be contacted through; [ibeecheme@yahoo.com](mailto:ibeecheme@yahoo.com)



**Emmanuel C. Ubani**

Owerri, Nigeria



**Prof. Emmanuel C. Ubani** holds BSc. and MEng in Industrial Engineering; PhD in Project Management Technology. Former Head, Department of Project Management Technology, and former Associate Dean, School of Management Technology, Federal University of Technology Owerri. He is a member of Nigeria Society of Engineers (MNSE), Fellow Institute of Industrial Administration (FIIA). He has published widely in both International and local Journals.